Pest Management Grants Final Report

Contract No. 97-0237

Biologically Integrated Prune System (BIPS) in Tahoma, Butte, and Glenn Counties

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Prepared for the California Department of Pesticide Regulation

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ABSTRACT

"BPS is a cooperative program for Prune Growers to refine and adopt farming practices that remain economically viable while striving to protect environmental quality "

The BPS project is a catalyst effort of The Nature Conservancy (TNC) to initiate adoption of reduced risk prune production. This collaborative program was assumed by the California Prune Board (CPB) and continued as a part of their Integrated Prune Farming Practices (IPFP) program. BPS is unique in its approach to assist farming systems near sensitive riparian corridors and waterways that create private stewardship of buffered areas to enhance biodiversity, wildlife, and protect environmental quality as primary objectives. The Nature Conservancy is committed to preserving and improving the ecologically rich riparian river systems and has assisted their farm neighbors in the adoption of the BPS methods.

The Nature Conservancy is very pleased with the support from the Department of Pesticide Regulation (DPR) in the development of the BPS project and the support of the California Prune Board in the continuation and implementation of pesticide reduction and stewardship through the IPFP program. The BPS project is a combined effort of private, public, business, research, and community partnership that has assisted in building a successful IPM Innovator commodity directed program.

EXECUTIVE SUMMARY

The BPS project was initiated by TNC to see how wildlands and farming can be compatible by helping local prune growers adopt farming systems that would help the health of the Sacramento River watershed. An Advisory Team (AT) of two progressive prune farmers, a Pest Control Advisor, a cover crop specialist, a filter strip researcher, a prune processing representative, and for the first year the University of California Farm Advisors assisted in the recruitment of the BPS growers and design of the program.

The first year ten growers joined the program and placed 15 to 25-acre blocks into a reduced chemical program, often pairing the block with an equally managed conventional block. The growers voluntarily tried the methods suggested by the AT to remove Diazinon and other organophosphate (OP) sprays. The methods included using *Bacillus thuringiensis* (BT), oil sprays, cover crops, grassed roadways, habitat and shrub plantings, and monitoring to reduce farm inputs and control pests by implementing a systems approach of functional farm biology. The project growers farm or manage over 6,000 acres of mixed orchard crops, and for them this was a testing area that they could expand to other parts of their ranch.

The University of California Farm Advisors left the Advisory Team and started a U.C. project, Environmentally Sound Prune Systems (ESPS) after the first year. The farmers focus the ESPS program on developing monitoring protocols for pest control to validate decision-making. Some of the concepts of farming for the benefit of wildlife, orchard/urban interfaces, and farming "with nature" through a whole systems approach including cover crops, grassed roadways, soil improvement with compost, beneficial insect shrub plantings are not currently addressed by the ESPS project.

To ensure that these core concepts of BPS were continued, the second year the BPS project added several more prune industry Advisory Team members and had monthly industry meetings on many different subjects to help all area orchardists. These meetings included a prune industry seminar, cover crop planting demonstration, brush shredding and air quality field meeting, a nitrogen reduction workshop, an irrigation efficiency workshop, and a spring bus tour of the project.

To help the BPS project integrate with other IPM efforts, the California Prune Board (CPB) was invited by TNC to be the Chairperson of the Advisory Team at the end of the second year. With the coordination of BPS as a CPB program the Prune Board was able to continue as much as possible the goals of TNC and has solicited funding through the newly formed Pest Management Alliance (PMA). With this and several other sources of funding the CPB formed the IPFP Program that acted as an umbrella for ESPS, BPS, and industry collaboration.

The Nature Conservancy has intended for the project to have several long-term impacts on the Prune Industry in the Sacramento Valley;

- Prune growers will implement pesticide reduction, private stewardship, and improve ecosystem diversity.
- Prune growers will use observational science and their intuition about orchard ecosystem management to make profitable decisions.
- The Prune Industry through their public relations will tell their story of the BPS program to the urban community and be recognized as good neighbors and stewards of the land in the Sacramento Valley community.

The broad based industry support was created by including as many different areas of interest as possible, especially private enterprise and the Pest Control Advisor community. There were six core parts of BPS that were impacted by the project whose support was important to its success. Those six separate groups were:

- The Nature Conservancy
- The Advisory Team
- The Project Growers
- The UC Cooperative Extension and IPM Research
- Pest Control Advisors & Pest Protection Industry
- The California Prune Board and Prune Industry

The Nature Conservancy is very pleased with the help from DPR in the development of the BPS project. The Department has recognized the importance of offering grants to groups that implement pesticide reduction and stewardship based upon currently known methods. The BPS project is a combined effort of a private, public, business, research, and community partnership that used the resources of the DPR grant to help build a successful IPM Innovator Prune program.

BODY OF REPORT

INTRODUCTION

The BPS project was a catalyst to help prune farmers reduce the use of Diazinon and other OPs in Sacramento Valley orchard crops. The purpose of the project was to bring together a public-private-commodity partnership that would accelerate the reduction of unnecessary applications of dormant and in season pesticide sprays within the Sacramento and Feather River watersheds. The project also had a goal of reducing synthetic nitrogen through the use of cover crops.

The program was initiated by The Nature Conservancy in Chico as part of their Sacramento River Project which aides the U.S. Fish and Wildlife Service (USFWS) by acquiring, managing, and reforesting land along the Sacramento River. The USFWS has a goal of establishing a 20,000-acre Riparian Preserve along the Sacramento River from Colusa to Red Bluff. This highly flood prone ground has many older orchards that are being acquired by USFWS/TNC during this restoration process over the next decade. TNC wishes to reduce or eliminate pesticides in property they manage and along adjacent farmland near the riparian areas to help increase the Neo-Tropical migrant songbirds. These tropical songbirds use the Sacramento River to travel up the valley from

Central and South America where they spend their winters. To achieve this goal TNC organized a group of people in 1994 and 1995 in exploratory meetings.

From 1994 to 1996 as the grant application was in progress, John Carlon, Cliff Kitayama, Rick Buchner, Bill Krueger, Dick Jacobs, Barney Flynn, Fred Thomas, Dawit Zeleke, Tom Hefernan, Jill Klein, and several others met at the TNC Stony Creek Preserve to discuss the project feasibility, potential demonstration farms and farmers, and the obstacles to reducing chemical inputs in prunes. From this initial group that met three times, an Advisory Team was formed when DPR awarded the IPM Innovator Grant, and the project started in the spring of 1996. The Advisory Team included David Evers as a farmer mentor along with Dick Jacobs. This preplanning for two years was very important in having a successful program.

The Advisory Team clearly understood that the reduction of OP sprays and reducing nitrogen by growing leguminous cover crops could be accomplished in the northern Sacramento Valley. There had already been many years of experience from organic prune producers in Yuba and Sutter Counties who did not spray and harvested top quality prunes. The University of California had already been working for eight years on using *Bacillus thuringiensis* (BT) for worm control and five years on ways to control the secondary pests Mealy Plum Aphid (MPA) and the Leaf Curl Plum Aphid (LCPA). These aphids would often infest 1 out of every 3 orchards that stopped using a dormant spray. The University was already rearing parasitoide wasps for a bio-control introduction program underway by Nick Mills. Advance models of aphid monitoring were being tested by Carolyn Pickel, Bill Krueger, Rick Buchner, and Bill Olson in combination with the Nick Mills program.

The DPR grant was based on following a BIOS model, which had been started three years earlier with almonds in Merced County by UC Farm Advisor Lonnie Hendricks, UC SAREP, and the Community Alliance for Family Farmers (CAFF). The BIOS model which is innovative and for some controversial, uses an Advisory Team (AT) to outreach to 10 farmers, and the AT helps those 10 project farmers implement the proposed program over several years with farm visits, a farm plan, and industry meetings. This model was followed and the BPS project was started with the help and support of the California Prune Board.

MATERIALS AND METHODS

The first meeting was a tour of the Stony Creek Ranch and Farmland Management demonstrating cover crops with sprinkler and drip irrigation systems, which had been established the previous year. Bob Elliott visited and assisted at these initial meetings and offered considerable help and direction from DPR. The summer was followed by several AT meetings and grower recruitment of six more growers willing to try a small acreage of prunes with a reduced risk program. Even though the size of the grower's BPS block was small with only 10 to 25 acres, the farmers that were attracted to the project were mostly medium to large acreage orchardists who in combination farmed 6,000 acres of prunes, peaches, almonds, walnuts, and other crops.

The Project Coordinator, Fred Thomas, had worked with several other BIFS and BIOS projects and by comparing these was able to avoid many problems that other projects encountered in their first year. By getting off to an aggressive start the BPS project was able to apply the funds into a broad industry approach. The supporters of this coalition included: DPR, NRCS, UCCE, EPA, USFWS, PRBO, TNC, RCDs, CPB, Prune Bargaining Association, Sunsweet Growers, CSU, Chico, Butte College, John Taylor Fertilizer, Helena Chemical, Simplot Soil Builders , Big Valley Ag, Scientific Methods, Ag Advisors, Lohse Mill, Circle R Irrigation, Bi-Counties Irrigation, Mid Valley Tractor, and others.

Table 1. BPS Advisory Team.

Project Chairpersons	Gary Obenauf	California Prune Board
	Bill Barnett	IPM Specialist Emeritus
Project Director	Dawit Zeleke	The Nature Conservancy
Project Coordinator	Fred Thomas	CERUS Consulting
Local Farmers	David Evers	Farmland Management
	Dick Jacobs	CSU, Chico Farm
Pest Control Advisor	Cliff Kitayama	Scientific Methods, Inc.
UCCE Liaison	Carolyn Pickel	Area IPM Specialist
Research/Filter Strips	Lee Altier, Ph.D.	CSU, Chico Agriculture
Agrichemical Representative	Carl Bruice	John Taylor Fertilizer
NRCS Liaison	Larry Branham	Tehama County
Prune Processing	Mark Gilles	Sunsweet Growers
	Bob Safford	Sunsweet Growers

The following farmers listed in Table 2 joined the program and encouraged their PCA's to participate in the Farm Visits and also learn from these BPS blocks. While not all of the farmers were able to implement the complete farm plan, all of the recommendations that they did try are listed in Table 3, and the funds came from their own operation budgets.

Table 2. BPS Project Growers.

County	Farm	Location	Acres in BPS
Tehama	Shasta View Farms	Gerber	25
Tehama	Farmland Management	Corning	20
Tehama	Abbey Ranch	Vina	15
Glenn	Billiou Orchards	Hamilton City	20
Glenn	Sol Norte	Butte City	20
Butte	CSU, Chico	Chico	25
Butte	Philip Stanfield	Biggs	20
Butte	Onstott Orchards	Gridley	15
Yuba	Kalkat Bros.	Marysville	15
Yuba	Curt Sanders	Marysville	12
Sutter	John Heier	Live Oak	10
Sutter	Thiara Ranches	Live Oak	20

Table 3. Adoption of BPS Recommendations by Project Growers.

Eliminate Diazinon	12 of 12
Reduce Nitrogen	3 of 12
Establish a Legume Cover Crop	5 of 12
Establish a Grass Cover Crop	4 of 12
Use Oil or Bt for Pest Control	6 of 12
Establish Insectary Shrubs	4 of 12

There are only three years to use the DPR IPM Innovator grant, which is why two years of preplanning is very important. A project must hit the ground running with demonstrations in place and media started. Since much of public perception is press and exposure, the Advisory Team planned to make the biggest push for meetings and media coverage during the 2nd year. The broad based media focus then encouraged further support of the industry, which we hoped would adopt the project and its goals during the third year. The phases of the program that was successful for the BPS project are listed in Table 4.

Table 4. Phases of BPS Project.

Preplanning
Form a broad based Advisory Team
UC Cooperative Extension assistance
Recruitment of Growers
Demonstration Orchards
Meetings for all prune growers
Newsletter to describe project
Industry support
Media Coverage
Project Tour
Exchange from TNC to CPB
Expansion of program with CPB IPFP

RESULTS

The project path had many turns but brought together enough cross section of industry, commodity, university, farmers, pest management, and outreach that the result of being a catalyst and not another institution was achieved. The goal of pesticide reduction was achieved even though aphid problems were not solved. The goal of 30% reduction in synthetic nitrogen application by the demonstration farms was not achieved. The reason that we did not reduce nitrogen application is that more than half of the prune growers in the project had a more serious problem with water infiltration. They did not want nitrogen from growing vetch or clover as much as they needed water infiltration. Instead of a nitrogen fixing cover crop they wanted a grass sod to help increase water entry into the soil. Also none of the growers put on compost because the very low price of prunes and the crop disaster of 1998 made that an uneconomic practice.

The California Prune Board was from the outset very helpful and directive in making the BPS project into the program it has become. Rich Peterson, Executive Director of the CPB, was glad to check press releases about the Prune Board, offered to fund the newsletter mailing out of the general fund, created a logo for the project, and regularly solicited articles for the CPB Newsletter. Gary Obenauf, Research Director of the CPB, helped with the prune farmers on the research board and the UC Farm Advisors as they developed their UC ESPS project and created considerable funding to continue the BPS project as part of a CPB IPM program. Through Gary's ongoing support, working with DPR, and acquiring additional funding he started the IPFP program that incorporates many of the concepts of BPS as TNC desired.

DISCUSSION

Eliminating Diazinon was easily accomplished even though it was risky for several growers who had outbreaks of aphids that needed to be controlled. What was more difficult was negotiating the politically correct web of industry, farmers, farm advisors, PCAs, processors, other BIOS groups, bargaining associations, pest protection, Agrichemical Industry, NRCS, and local RCDs. The goal was to create a collaborative group that could accomplish the task of reaching the prune farmers of the valley.

The project was less about solutions to research problems and more about communication, community, collaboration, and cooperation. There was not a problem with biocontrol of prunes since the University of California had been working on the issues of pest control very strongly after establishing that BT could be used effectively for worm control eight years ago. What was needed was an expansion of the dialogue and community exposure to the success of the University of California and California Prune Board programs. To that end BPS represented another venue of communication, a different newsletter, different meeting agendas and speakers to demonstrate IPM and a "whole systems" approach to prune farming.

The best-cost projection of the project is the leverage of the original DPR IPM Innovator grant of $90,000. The use of these funds when combined with the already substantial CPB IPM research budget was able to generate the following combined funds as listed in Table 5 by 1999.

Table 5. Value of the BPS Project as a financial catalyst.

CPB IPM Research	$200,000
CPB Overhead	10,000
TNC Overhead	10,000
Advisory Team (Pro bono)	20,000
Farmers (Pro bono)	20,000
UCCE Liaison/Help	20,000
TNC 319	88,000
NRCS EQIP	18,000
CPB to BPS (Newsletter)	5,000
FREP to CSU, Chico	65,000
PMA - DPR	105,000
CPB SAREP	200,000
CPB CSREES	120,000
	$980,000

None of the growers suffered a significant loss because the EPA funding covered monitoring and the grower's PCA was also monitoring and quickly alerted us to problems. Pyrethroid sprays in season were applied to kill aphid outbreaks on 3 ranches. BPS is a Sacramento Valley community project that involved many people within the farming community to create the results that occurred. The Glenn County Stewardship committee played a significant role in presenting the program as did Sunsweet Growers, Inc. who had BPS make presentations at several of their grower meetings.

SUMMARY AND CONCLUSIONS

The Nature Conservancy was granted funding by the Department of Pesticide Regulation IPM Innovator program and started a BIOS style program for prunes in the upper Sacramento Counties of Butte, Glenn, and Tehama. After two years TNC gave the BPS project to the California Prune Board as part of a multiple effort at reducing pesticides, improving water quality, and fostering agricultural and community involvement in stewardship of the Sacramento Valley.

The growers could often reduce pesticides in prunes because prunes are among the easiest stone fruit to eliminate pesticide inputs. With the exception of fungicides to protect the pollination and fruit set; prunes similarly to grapes, do not require many inputs because the fruit quality is sufficient for dehydration.

The lack of an effective biological or soft chemical control for aphids in prune culture remains a major challenge to the ecological production of prunes in the Sacramento Valley.

- The Support of the Commodity Board is Essential in a BIOS style program.
- The Support of UCCE in each County is Essential in a BIOS style program.
- There are many willing farmers who will risk a yield reduction to learn for themselves and to help their industry.
- The need to recognize the value of farmers as stewards of open space and agricultural land should be focused upon by the prune industry.

- UCCE has been stretched beyond its capacity for the past 6 years in the Sacramento Valley, and the role of extension advisors has been hampered by administration duties and research.
- The Project was successful and the DPR funds multiplied many fold.
- The PMA program as instituted by Jean-Mari Peltier has been ideally instrumental in creating the integration of the many stakeholders of a commodity in pesticide reduction.

GLOSSARY OF ABBREVIATIONS AND SYMBOLS

AT	Advisory Team
BIFS	Biologically Integrated Farming Systems.
BIOS	Biologically Integrated Orchard Systems.
BPS	Biological Prune Systems.
BT	*Bacillus thuringiensis*.
CAFF	Community Alliance of Family Farmers
CC	Cover Crop.
CPB	California Prune Board.
CSREES	Cooperative State Research, Education, and Extension Service.
DPR	Department of Pesticide Regulation.
EBPM	Ecologically Based Production Management.
EPA	Environmental Protection Agency.
ESPS	Environmentally Sound Prune Systems.
IPFP	Integrated Prune Farming Practices.
IPM	Integrated Pest Management.
LCPA	Leaf Curl Plum Aphid.
MPA	Mealy Plum Aphid.
NRCS	Natural Resources Conservation Service
PBA	Prune Bargaining Association.
PCA	Pest Control Advisor
PMA	Pest Management Alliance.
PRBO	Point Reyes Bird Observatory.
RCD	Resource Conservation District.
SAREP	Sustainable Agriculture Research and Education Project.
TNC	The Nature Conservancy.
UCCE	University of California Cooperative Extension.
USFWS	United States Fish and Wildlife Service.